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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/597,010	04/20/2007	Alexander Schnell	003-239	4697

36844 7590 04/12/2010

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EXAMINER	
MEKHLIN, ELI S	

ART UNIT	PAPER NUMBER
1795	

NOTIFICATION DATE	DELIVERY MODE
04/12/2010	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No.	Applicant(s)	
	10/597,010	SCHNELL ET AL.	
	Examiner	Art Unit	
	ELI S. MEKHLIN	1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *09 February 2010*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,2 and 5-11* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☐ Claim(s) *1, 2 and 5-11* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

(1)

Claims 1, 2 and 5-11 are pending before the Office for review. This action is in response to a Pre-Appeal Conference request filed on February 9, 2010.

(2)

Claim Rejections - 35 USC § 103

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claims 1-2 and 5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Budinger et al. (U.S. Patent No. 5,240,491).

With respect to **claim 1**, Budinger teaches a braze alloy that consists essentially of, by weight, 4 to 18.5 % Co, 4.5 to 14 % Cr, 3 to 6.2 % Al, 0 to 5 % Ti, 0 to 4 % Mb, 3.8 to 13.7 % Ta, 4 to 11 % W, 0 to 0.5 % Nb, 0 to 12 % Re, 0 to 1.55 % Hf, 0 to 0.3 % Y and boron and silicon as incidental impurities. Claim 1. When the composition does not contain titanium, molybdenum, niobium, rhenium or hafnium, the claimed composition overlaps with the ranges of the presently claimed braze alloy except for the presence of boron. As per the MPEP, "where the claimed ranges overlap or lie inside the ranges disclosed by the prior art, a *prima facie* case of obviousness exists." MPEP 2144.05(I) (internal quotation omitted).

Additionally, Budinger teaches that boron can be added to compositions as a melting point depressant. Col. 2, Lines 2-6. Specifically, Budinger teaches that the allow described above can be combined with a low melt alloy to provide brazing alloys

that provide joints at temperatures significantly higher than joints made with prior art brazing alloys. Abstract. The low melt composition of the dual-alloy braze comprises 0 to 2.3 % boron, which overlaps with the claimed range. Claim 1. The dual-alloy braze has a bulk composition of 0 to 1 % boron. Claim 1.

Therefore, it would have been obvious to a person having ordinary skill in the art at the time of invention to add boron to the high-melt component of the dual-alloy brazing alloy, as described above by Budinger, because Budinger teaches that boron can be used as a melting point depressant and a person having ordinary skill in the art at the time of invention would have appreciated that adding boron to the high-melt component of the bulk composition would allow for a bulk composition that has a melting point within a desired range, i.e. within the range used in the low-melt component.

Additionally, a person having ordinary skill in the art at the time of invention would have appreciated that Budinger establishes boron as a result effective variable that can be used to influence the melting point of a braze alloy. Specifically, Budinger teaches that the amount of boron in an alloy directly influences the melting point. Claim 1. This is clear from the fact that an alloy containing little boron is a high-melt alloy whereas an alloy containing up to 2.3 % boron is a low-melt alloy. Accordingly, as per the MPEP, "where the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation." MPEP 2144.05(II) (internal quotation omitted).

With respect to **claim 2**, Budinger teaches that the alloy, as described above, can be used to braze nickel-based articles and that the alloy can be particularly used to braze single grain super alloy articles, which would be expected to be directionally solidified. Col. 1, Lines 37-42 and Col. 2, Lines 24-29.

With respect to **claim 5**, Budinger teaches that the nickel-based article can be a gas turbine component. Col. 1, Lines 11-14.

(3)

Claims 6 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Budinger et al. (U.S. Patent No. 5,240,491), as applied to claims 1, 2 and 5 above, and further in view of Stern (U.S. Patent No. 4,507,264).

With respect to **claim 6**, Budinger teaches a braze alloy with the required composition but is silent as to whether the braze alloy is in the form of a paste, foil, an ingredient in a blend braze paste, tape or pre-sintered sheet.

However, Stern, which deals with brazing methods, teaches a method of brazing that includes applying the braze alloy in a paste form to a super alloy joint, heating the joint to the brazing temperature in a vacuum furnace, followed by a post-braze heat treatment. Col. 6, Lines 1-8.

Therefore, it would have been obvious to a person having ordinary skill in the art at the time of invention to use the braze alloy taught by Budinger in paste form because Stern teaches that a braze alloy paste can be effectively used to braze an article. Col.6 Lines 1-8.

With respect to **claim 10**, Stern teaches that the braze alloy, in paste form, is applied to a super-alloy article joint and the joint is heated to the brazing temperature in a vacuum furnace, followed by a post-braze heat treatment. Col. 6, Lines 1-8. Stern does not state that the braze paste is mixed with any other additive. Additionally, Stern teaches that the braze temperature can be as high as 2150° C. Claim 3. Stern teaches that the braze alloy is particularly suitable for brazing nickel-based super-alloy articles. Col. 2, Line 1.

(4)

Claims 7, 8 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Budinger et al. (U.S. Patent No. 5,240,491), as applied to claims 1, 2 and 5 above, and further in view of Stern (U.S. Patent No. 4,507,264) and Schaefer et al. (U.S. Patent No. 5,806,751).

With respect to **claim 7**, Budinger teaches a braze alloy meeting the compositional requirements of the claim but is silent as to the physical configuration of the alloy and whether it comprises a filler material.

However, Schaefer, which deals with methods of repairing gas turbine components, teaches that it is difficult to use a brazing alloy, absent a filler material, to braze large defects in gas turbine components. Col. 1, Lines 32-35. Schaefer teaches that it is known in the art to use metallic alloy filler with a braze alloy to affect the repair of large defects. Col. 1, Lines 42-43. The metallic alloy filler has a composition similar to the material the metallic alloy article that is being repaired, which in this case is a nickel or cobalt based super-alloy. Col. 2, Lines 20-21.

Additionally, with respect to the physical configuration of the braze alloy, Stern teaches that the braze alloy, when in paste form, can be effectively used to braze super-alloy articles. Col. 6, Lines 1-8.

Therefore, it would have been obvious to a person having ordinary skill in the art at the time of invention to use a braze paste and combine it with a filler consisting of cobalt or nickel super-alloy because Schaefer teaches that metallic filler, with a composition substantially similar to the article to be brazed, can be combined with a braze alloy to form a braze product and that such a braze product can more effectively repair large defects in nickel or cobalt-based super-alloy articles. Additionally, Stern teaches that braze pastes can be effectively used to braze, i.e. repair super-alloy articles.

With respect to **claim 8**, Schaefer teaches that the braze alloy, the second metallic filler material, is between 0 to 40 wt% of the entire braze product. Col. 2, Lines 31-37. This range completely covers the claimed range of 0 to 30 wt%. Where the claimed ranges overlap or lie inside ranges disclosed by the prior art, a *prima facie* case of obviousness exists. *In re Woodruff*, 919 F.2d 1575 (Fed. Cir. 1990).

With respect to **claim 11**, Budinger, Stern and Schaefer, as combined above, teach that the braze product, which is a braze paste and a metallic filler wherein the metallic filler has the same composition of the article to be brazed, can be used to braze a nickel or cobalt-based super-alloy article, such as a gas turbine component. Schaefer, Col. 1, Lines 11-42.

Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Budinger et al. (U.S. Patent No. 5,240,491) Stern (U.S. Patent No. 4,507,264) and Schaefer et al. (U.S. Patent No. 5,806,751), as applied to claims 7, 8 and 11 above, and further in view of Van Esch (U.S. Patent No. 6,575,349) and Rafferty (U.S. Patent No. 6,612,480).

With respect to **claim 9**, Budinger, Stern and Schaefer, as combined above, are silent as to whether a pre-sintered braze sheet having no binder is used as a brazing product.

However, Van Esch, which deals with a method of applying braze to a substrate, teaches that pre-sintering braze products reduces the need for binder and/or adhesive and produces a better braze. Col. 1, Lines 60-65. Additionally, Rafferty teaches that a pre-sintered braze sheet (preform) is a highly effective technique that can be used to braze a product. Col. 1, Lines 45-50.

Therefore, it would have been obvious to a person having ordinary skill in the art at the time of invention to use a pre-sintered braze sheet because Van Esch teaches that pre-sintering eliminates the need for binder and produces a better braze and Rafferty teaches that a preform, which can be a sheet, is a highly effective brazing technique.

(6)

Claims 1-2 and 5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Budinger et al. (U.S. Patent No. 5,240,491) in view of Schnell et al (U.S. Publication No. 2003/0066177).

With respect to **claim 1**, Budinger teaches a braze alloy that consists essentially of, by weight, 4 to 18.5 % Co, 4.5 to 14 % Cr, 3 to 6.2 % Al, 0 to 5 % Ti, 0 to 4 % Mb, 3.8 to 13.7 % Ta, 4 to 11 % W, 0 to 0.5 % Nb, 0 to 12 % Re, 0 to 1.55 % Hf, 0 to 0.3 % Y and boron and silicon as incidental impurities. Claim 1. When the composition does not contain titanium, molybdenum, niobium, rhenium or hafnium, the claimed composition overlaps with the ranges of the presently claimed braze alloy except for the presence of boron. As per the MPEP, "where the claimed ranges overlap or lie inside the ranges disclosed by the prior art, a *prima facie* case of obviousness exists." MPEP 2144.05(I) (internal quotation omitted).

Additionally, Schnell, which deals with brazing alloys, teaches that approximately 2.5 wt % boron can be added to a braze alloy as a favorable amount of a melting point depressant. Paragraph 43.

Therefore, it would have been obvious to a person having ordinary skill in the art at the time of invention to add boron to the braze alloy taught by Budinger because Schnell teaches that doing so can depress the melting point of the braze alloy. Paragraph 43. Specifically, a person having ordinary skill in the art at the time of invention would have appreciated that the high-melt alloy taught by Budinger could be turned into an effective low-melt alloy via the addition of boron, as explained by Budinger.

With respect to **claim 2**, Budinger and Schnell, as combined above, teach that the braze alloy is used for brazing nickel-based articles wherein the article can be a single crystal alloy. Budinger, Col. 1, Lines 38-43 and Schnell, Paragraph 22.

With respect to **claim 5**, Schnell teaches that the single crystal article can be a gas turbine component. Paragraph 22.

(7)

Claims 6 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Budinger et al. (U.S. Patent No. 5,240,491) and Schnell et al (U.S. Publication No. 2003/0066177), as applied to claims 1, 2 and 5 above, and further in view of Stern (U.S. Patent No. 4,507,264).

With respect to **claim 6**, Budinger and Schnell, as combined above, teach a braze alloy with the required composition but are silent as to whether the braze alloy is in the form of a paste, foil, an ingredient in a blend braze paste, tape or pre-sintered sheet.

However, Stern, which deals with brazing methods, teaches a method of brazing that includes applying the braze alloy in a paste form to a super alloy joint, heating the joint to the brazing temperature in a vacuum furnace, followed by a post-braze heat treatment. Col. 6, Lines 1-8.

Therefore, it would have been obvious to a person having ordinary skill in the art at the time of invention to use the braze alloy taught by Budinger and Schnell, as combined above, in paste form because Stern teaches that a braze alloy paste can be effectively used to braze an article. Col.6 Lines 1-8.

With respect to **claim 10**, Stern teaches that the braze alloy, in paste form, is applied to a super-alloy article joint and the joint is heated to the brazing temperature in

a vacuum furnace, followed by a post-braze heat treatment. Col. 6, Lines 1-8. Stern does not state that the braze paste is mixed with any other additive. Additionally, Stern teaches that the braze temperature can be as high as 2150° C. Claim 3. Stern teaches that the braze alloy is particularly suitable for brazing nickel-based super-alloy articles. Col. 2, Line 1.

(8)

Claims 7, 8 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Budinger et al. (U.S. Patent No. 5,240,491) and Schnell et al (U.S. Publication No. 2003/0066177), as applied to claims 1, 2 and 5 above, and further in view of Stern (U.S. Patent No. 4,507,264) and Schaefer et al. (U.S. Patent No. 5,806,751).

With respect to **claim 7**, Budinger and Schnell, as combined above, teach a braze alloy meeting the compositional requirements of the claim but are silent as to the physical configuration of the alloy and whether it comprises a filler material.

However, Schaefer, which deals with methods of repairing gas turbine components, teaches that it is difficult to use a brazing alloy, absent a filler material, to braze large defects in gas turbine components. Col. 1, Lines 32-35. Schaefer teaches that it is known in the art to use metallic alloy filler with a braze alloy to affect the repair of large defects. Col. 1, Lines 42-43. The metallic alloy filler has a composition similar to the material the metallic alloy article that is being repaired, which in this case is a nickel or cobalt based super-alloy. Col. 2, Lines 20-21.

Additionally, with respect to the physical configuration of the braze alloy, Stern teaches that the braze alloy, when in paste form, can be effectively used to braze super-alloy articles. Col. 6, Lines 1-8.

Therefore, it would have been obvious to a person having ordinary skill in the art at the time of invention to use a braze paste and combine it with a filler consisting of cobalt or nickel super-alloy because Schaefer teaches that metallic filler, with a composition substantially similar to the article to be brazed, can be combined with a braze alloy to form a braze product and that such a braze product can more effectively repair large defects in nickel or cobalt-based super-alloy articles. Additionally, Stern teaches that braze pastes can be effectively used to braze, i.e. repair super-alloy articles.

With respect to **claim 8**, Schaefer teaches that the braze alloy, the second metallic filler material, is between 0 to 40 wt% of the entire braze product. Col. 2, Lines 31-37. This range completely covers the claimed range of 0 to 30 wt%. Where the claimed ranges overlap or lie inside ranges disclosed by the prior art, a *prima facie* case of obviousness exists. *In re Woodruff*, 919 F.2d 1575 (Fed. Cir. 1990).

With respect to **claim 11**, Budinger, Schnell, Stern and Schaefer, as combined above, teach that the braze product, which is a braze paste and a metallic filler wherein the metallic filler has the same composition of the article to be brazed, can be used to braze a nickel or cobalt-based super-alloy article, such as a gas turbine component. Schaefer, Col. 1, Lines 11-42.

Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Budinger et al. (U.S. Patent No. 5,240,491), Schnell et al (U.S. Publication No. 2003/0066177), Stern (U.S. Patent No. 4,507,264) and Schaefer et al. (U.S. Patent No. 5,806,751), as applied to claims 7, 8 and 11 above, and further in view of Van Esch (U.S. Patent No. 6,575,349) and Rafferty (U.S. Patent No. 6,612,480).

With respect to **claim 9**, Budinger, Schnell, Stern and Schaefer, as combined above, are silent as to whether a pre-sintered braze sheet having no binder is used as a brazing product.

However, Van Esch, which deals with a method of applying braze to a substrate, teaches that pre-sintering braze products reduces the need for binder and/or adhesive and produces a better braze. Col. 1, Lines 60-65. Additionally, Rafferty teaches that a pre-sintered braze sheet (preform) is a highly effective technique that can be used to braze a product. Col. 1, Lines 45-50.

Therefore, it would have been obvious to a person having ordinary skill in the art at the time of invention to use a pre-sintered braze sheet because Van Esch teaches that pre-sintering eliminates the need for binder and produces a better braze and Rafferty teaches that a preform, which can be a sheet, is a highly effective brazing technique.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ELI S. MEKHLIN whose telephone number is (571)270-7597. The examiner can normally be reached on 5/4/9.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jennifer K. Michener can be reached on 571-272-1424. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/ELI S MEKHLIN/
Examiner, Art Unit 1795

/Jennifer K. Michener/
Supervisory Patent Examiner, Art Unit 1795